UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/608,215	GALLAGHER ET AL.
	Examiner	Art Unit
	Tri H. Phan	2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _13 July 2007_.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) _18-22_ is/are allowed.

6) ☐ Claim(s) _1-3,5,7,8,10,11,14,16,17,23 and 25_ is/are rejected.

7) ☐ Claim(s) _4,6,9,12,13,15 and 24_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment/Arguments

1.   This Office Action is in response to the communication(s) filed on June 30th, 2003.

Claims 1-25 are now pending in the application.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1-3, 5, 7-8, 10-11, 14, 16-17, 23 and 25 are rejected under 35 U.S.C. 102(e) as

being anticipated by **Aweya et al.** (U.S.6,961,307; hereinafter refer as 'Aweya').

         - In regard to claim 1, **Aweya** discloses *a system for providing congestion control* (for

example see fig. 1; col. 7, lines 28-37)*, which comprises*

         a buffer memory configured to temporarily store data in a plurality of queues ('data buffer

20' in fig. 1; for example see col. 5, lines 28-34; wherein the class determination tools 50 classify

incoming packets into classes, e.g. *"queues"*, for storing in data buffer)*; and*

a processor ('packet drop controller 30' in fig. 1; for example see col. 5, lines 35-40)

configured to:

measure a total amount of memory occupied by the plurality of queues in the buffer

memory ('procedure B' in fig. 4; for example see col. 6, lines 66-67),

modify lengths of the plurality of queues based on the total amount of memory occupied

('procedure B' in fig. 4; for example see col. 5, line 63 through col. 6, line 5; col. 6, line 67

through col. 7, line 2), *and*

modify drop profiles ('drop probability') *associated with the plurality of queues based on*

the total amount of memory occupied ('procedures C-E' in fig. 4; for example see figs. 4-6B; col.

5, line 63 through col. 6, line 5; col. 12, lines 5-9).

- Regarding claims 2 and 11, **Aweya** further discloses step of *initially allocate lengths to*

the plurality of queues based on a total number of the plurality of queues (for example see step

C10 in fig. 5).

- In regard to claim 3, **Aweya** further discloses step of *designate one of a plurality of*

discrete memory usage levels into which the total amount of memory falls (for example see col.

9, lines 1-5).

- Regarding claim 5, **Aweya** further discloses step of *change minimum queue thresholds*

('no-drop threshold L'; col. 6, lines 9-14) *and maximum queue thresholds* ('upper bound' or

'max' of the current overall drop probability of equation 12) *associated with the drop profiles*

based on the lengths of the plurality of queues (wherein no-drop threshold depends on average

buffer utilization level and queuing delay as disclosed in col. 5, lines 50-52, and the upper bound

of current overall drop probability depends on sample queue size $q(n)$ as disclosed in col. 9, line

49 through col. 10, line 8).

- In regard to claims 7 and 16, **Aweya** further discloses step of *modify different drop*

profiles that are associated with different classes of data within the plurality of queues (for

example see step D30 in fig. 6A, step D130 in fig. 6B; col. 8, line 48 through col. 9, line 29).

- Regarding claims 8 and 17, **Aweya** further discloses step of *selectively drop data from*

the plurality of queues based on the drop profiles (for example see procedure F in fig. 4; col. 9,

lines 26-28).

- In regard to claim 10, **Aweya** discloses, *a device comprises*

a buffer memory configured to temporarily store data in a plurality of queues ('data

buffer 20' in fig. 1; for example see col. 5, lines 28-34; wherein the class determination tools 50

classify incoming packets into classes, e.g. "*queues*", for storing in data buffer); *and*

a processor ('packet drop controller 30' in fig. 1; for example see col. 5, lines 35-40)

configured to:

measure a fullness of the buffer memory ('procedure B' in fig. 4; for example see

col. 6, lines 66-67),

assign sizes to the plurality of queues based on the fullness of the buffer

memory (for example see col. 5, lines 63-65; col. 7, lines 10-12), and

adjust thresholds of drop profiles associated with the plurality of queues based on

the sizes assigned to the plurality of queues (for example see col. 5, line 63 through col.

6, line 5; and wherein upper bound on overall drop probability in equation 12, e.g.

"thresholds of drop profiles", depends on sample queue size q(n) as disclosed in col. 9,

line 49 through col. 10, line 8).

- Regarding claim 14, **Aweya** further discloses, a shared memory ('shared buffer')

connected to the processor and configured to store information for use in adjusting thresholds of

the drop profiles associated with the plurality of queues (for example see col. 9, lines 1-28),

wherein when adjusting thresholds of the drop profiles, the processor is configured to:

read the information from the shared memory for use in adjusting the thresholds (for example

see col. 9, line 29 through col. 10, line 8).

- In regard to claim 23, **Aweya** discloses, a method for providing congestion control for

data stored in queues (for example see figs. 1 and 4; col. 7, lines 28-37; wherein incoming

packets are classified into different classes, e.g. "queues", and stored in data buffer) comprises

dynamically changing oversubscription of the queues based on total usage of a memory

that contains the queues to set new lengths ('update aggregate load or queue size') for the queues

('procedure B' in fig. 4; for example see col. 5, lines 63-65; col. 6, line 67 through col. 7, line 2);

and

performing random early detection on the queues based on the new lengths ('procedure F' in fig. 4; for example see col. 5, line 63 through col. 6, line 5; where packet drop functionality, e.g. random early detection 'RED' is disclosed in col. 2, lines 40-52; is determined based on updating aggregate load or queue size).

- Regarding claim 25, **Aweya** discloses, *a system for providing congestion control for data stored in queues* (for example see fig. 1; col. 7, lines 28-37), *which comprises*

means for measuring memory usage ('procedure B' in fig. 4; for example see col. 6, lines 66-67);

means for updating a length of a queue based on the measured memory usage ('procedure B' in fig. 4; for example see col. 5, lines 63-65; col. 6, line 66 through col. 7, line 2);

means for updating minimum and maximum thresholds of a drop profile associated with the queue based on the updated length of the queue (wherein no-drop threshold L as disclosed in col. 6, lines 9-14, and upper bound of the current overall drop probability as disclosed in equation 12, e.g. *"minimum and maximum thresholds of drop profile"*, depend on average buffer utilization level and queuing delay as disclosed in col. 5, lines 50-52, and on sample queue size $q(n)$ as disclosed in col. 9, line 49 through col. 10, line 8); *and*

means for selectively dropping data from the queue based on the updated minimum and maximum thresholds of the drop profile associated with the queue (for example see procedure F in fig. 4; col. 9, lines 26-28).

Response to Amendment/Arguments

4.   Applicant's arguments filed on July 13th, 2007 have been fully considered but they are not persuasive.

In the REMARKS, pages 2-4, Applicant argues that **Aweya** fails to disclose "*a processor configured to modify lengths of a plurality of queues based on a total amount of memory occupied*", as required by claim 1. Examiner respectfully disagrees. **Aweya** discloses wherein the drop decision module and packet drop controller, e.g. "*processor*", monitor the queue size or aggregate load in the data buffer, determine packet drop probability per class and decide whether to drop packet or not, e.g. "*modify lengths of a plurality of queues based on a total amount of memory occupied*", as disclosed in col. 5, line 63 through col. 6, line 5; col. 6, line 67 through col. 7, line 2; and wherein the packet drop probability per class is computing based on the actual queue size q(n) and current threshold T(n) at discrete time as disclosed in col. 7, lines 27-56; col. 9, line 49 through col. 10, line 8; thus, the drop decision module and packet drop controller keep received updated load information for actual queue size, e.g. "*modify lengths of a plurality of queues based on a total amount of memory occupied*"; and when incoming packet is stored in the queue, the actual queue size is changed, e.g. "*lengths for the queues*" is modified, for calculating the queue's packet drop probability.

Aweya also discloses wherein determination of dropped packet is after queueing, through the drop mechanism procedure as specified in col. 11, lines 1-10, e.g. "*modify lengths of a plurality*

of queues based on a total amount of memory occupied". Therefore, Examiner concludes that

Aweya teaches the arguable feature.

In the REMARKS, pages 4-5, Applicant argues that **Aweya** fails to disclose "*a processor*

configured to adjust thresholds of drop profiles associated with the plurality of queues based on

the size assigned to the plurality of queues", as required by claim 10. Examiner respectfully

disagrees. **Aweya** discloses wherein the drop decision module and packet drop controller, e.g.

"*processor*", monitor the queue size or aggregate load in the data buffer, determine packet drop

probability per class for deciding whether to drop packet or not as disclosed in col. 5, line 63

through col. 6, line 5; col. 6, line 67 through col. 7, line 2; and wherein the packet drop

probability per class is computing based on the current threshold T(n) as disclosed in col. 7, lines

27-56; col. 9, line 49 through col. 10, line 8; the drop decision module and packet drop controller

keep received updated load information, e.g. "*thresholds of drop profiles*" are adjusted, for

calculating packet drop probability. Therefore, Examiner concludes that **Aweya** teaches the

arguable feature.

In the REMARKS, pages 5-6, Applicant argues that **Aweya** fails to disclose the method

for "*dynamic changing oversubscription of the queues based on total usage of a memory that*

contains the queues to set new lengths for the queues", as required by claim 23. Examiner

respectfully disagrees. **Aweya** discloses wherein the drop decision module and packet drop

controller, e.g. "*processor*", monitor the queue size or aggregate load in the data buffer,

determine packet drop probability per class for deciding whether to drop packet or not as

disclosed in col. 5, line 63 through col. 6, line 5; col. 6, line 67 through col. 7, line 2; and

wherein the packet drop probability per class is computing based on the actual queue size q(n)

and current threshold T(n) at discrete time as disclosed in col. 7, lines 27-56; col. 9, line 49

through col. 10, line 8; thus, the drop decision module and packet drop controller keep received

updated load information for actual queue size, e.g. *"dynamic changing oversubscription of the

queues"*; and when incoming packet is stored in the queue, the actual queue size is changed, e.g.

"new lengths for the queues" is set, for calculating the queue's packet drop probability.

Therefore, Examiner concludes that **Aweya** teaches the arguable feature.

In the REMARKS, pages 7-9, Applicant argues that **Aweya** fails to disclose the means

for *"updating a length of a queue based on the measured memory usage"*, as required by claim

25. Examiner respectfully disagrees. **Aweya** discloses wherein the drop decision module and

packet drop controller, e.g. *"processor"*, monitor the queue size or aggregate load in the data

buffer, determine packet drop probability per class and decide whether to drop packet or not, e.g.

"modify lengths of a plurality of queues based on a total amount of memory occupied", as

disclosed in col. 5, line 63 through col. 6, line 5; col. 6, line 67 through col. 7, line 2; and

wherein the packet drop probability per class is computing based on the actual queue size q(n)

and current threshold T(n) at discrete time as disclosed in col. 7, lines 27-56; col. 9, line 49

through col. 10, line 8; thus, the drop decision module and packet drop controller keep received

updated load information for actual queue size, e.g. *"updating a length of a queue"*; and when

incoming packet is stored in the queue, the actual queue size is changed, e.g. *"lengths for the

queues" is updated, for calculating the queue's packet drop probability. Therefore, Examiner

concludes that **Aweya** teaches the arguable feature.

Claims 2-3, 5, 7-8, 11, 14, 16-17 are rejected as in Part 3 above of this Office action and

by virtue of their dependence from claims 1 and 10.

Allowable Subject Matter

5.   Claims 4, 6, 9, 12-13, 15 and 24 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

6.   Claims 18-22 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Many references in the art disclose the Random Early Detection and its newer variants.

But no prior art reference discloses method for decreasing/increasing sizes of the queues when

the fullness of buffer memory increases/decreases; and adjusting queue fullness thresholds for

particular queue defining queue fullness region for randomly dropping data.

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Tri H. Phan, whose telephone number is (571) 272-3074. The

examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chi H. Pham can be reached on (571) 272-3179.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(571) 273-8300

Hand-delivered responses should be brought to Randolph Building, 401 Dulany Street,

Alexandria, VA 22314.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Technology Center 2600 Customer Service Office, whose telephone

number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tri H. Phan
October 1, 2007

CHI PHAM
SUPERVISORY PATENT EXAMINER